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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/659,108	09/09/2003	Gerald H. Negley	5308-311	4336
7590	05/02/2005		EXAMINER LE, THAO X	
Mitchell S. Bigel Myers Bigel Sibley & Sajovec, P.A. P.O. Box 37428 Raleigh, NC 27627			ART UNIT 2814	PAPER NUMBER

DATE MAILED: 05/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/659,108	<b>Applicant(s)</b> NEGLEY ET AL.	
	<b>Examiner</b> Thao X. Le	<b>Art Unit</b> 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 15 March 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 3-7 and 9-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 3-7 and 9-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

### DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action dated 11/18/04 is withdrawn.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 3-5, 10-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6531328 to Chen in view of US 6599768 to Chen.

Regarding claim 3, Chen discloses a mounting substrate for a semiconductor light emitting device in fig. 18 comprising: a solid silicon block 8, column 4 line 43, including a cavity (concave portion) in a face thereof that is configured for mounting a semiconductor light emitting device (LED) 3 therein, column 5 line 24, and a conformal insulating coating 15 comprising silicon oxide, column 5 line 4, on a surface of the solid silicon block 8, first and second spaced apart conductive traces 16/18, column 5 line 7, on the conformal insulating coating 15 in the cavity that are configured for connection to a light emitting diode, fig. 17.

But, Chen (328) does not disclose a solid block is aluminum and an insulating layer 15 is aluminum oxide.

However, Chen (768) discloses a mounting substrate for a semiconductor light emitting device in fig. 3J wherein the substrate 100 comprises copper, aluminum, or silicon, column 4 line 64. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the aluminum or silicon substrate teaching of Chen (768) to replace the silicon with aluminum in Chen (328)'s device, because such material replacement would have provided a comparable high electric and thermal conductivity and thus provides excellent heat dissipated capacity as taught by Chen (768), column 4 lines 43-46 and 62-65 and table 1.

With respect to aluminum oxide layer, at the time the invention was made; it would have been obvious to one of ordinary skill in the art to anodic oxidation aluminum substrate of Chen (768) in order to create a aluminum oxide dielectric

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layer, because such aluminum anodic oxidation is a typical process to make aluminum oxide dielectric layer on the aluminum substrate, see Kobayashi (6219223) in column 4 lines 30-35 fig. 2.

Regarding claims 4-5, 16-17, Chen (328) discloses the mounting substrate according to Claim 3 wherein face is a first face and wherein the first and second spaced apart conductive traces 16/18 extend from the cavity to the first face, around at least one side of the block 8 and onto a second face of the block 8 that is opposite the first face, fig. 9 and 17, wherein the first and second spaced apart 16/18 on the conformal insulating coating 15 in the cavity comprise reflective material, column 4 line 17.

Regarding claims 6-7, Chen (328) discloses the mounting substrate in fig. 18 comprising a first face (top surface) and wherein the solid substrate block 8, column 4 line 43, includes therein first and second through holes 14, column 4 line 58 that extend from the first face to a second face of the solid block 8 that is opposite the first face, the respective first and second through holes including a respective first and second conductive via therein that extends from the first face to the second face and wherein a respective one of the spaced apart conductive traces 16/17/18, column 5 lines 5-10, is electrically connected to a respective one of the conductive vias 14, fig. 18, and vias 14, and wherein the first and second through holes 14 extend from the cavity 11, fig. 8, to the second face.

Regarding claim 10, Chen discloses the mounting substrate in fig. 18 further comprising third and fourth space apart conductive traces 18/17 on the second face of

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the solid block a respective one of which is connected to a respective one of the conductive vias 14.

Regarding claims 11-14, Chen (328) discloses the mounting substrate in combination with a semiconductor light emitting device 3 that is mounted in the cavity and is connected to the first and second spaced apart conductive traces 16/18 fig. 17, further in combination with a lens 23, column 5 line 58, that extends across the cavity, in further combination with an encapsulant 5, column 5 line 27, between the semiconductor light emitting device 3 and the lens 23, and further combination with lens retainer (leg portion of lens 23) on the solid block 8 that is configured to hold the lens 23 across the cavity, fig. 18.

Regarding claim 15, Chen (328) discloses a light emitting device in fig. 18 comprising: a solid silicon block 8 including a cavity (concave portion), in a face thereof and a conformal silicon oxide layer 15 on a surface thereof including on the cavity, fig. 18, first and second spaced apart conductive traces 16/18 on the conformal silicon oxide layer 15 in the cavity; a semiconductor light emitting device 3 that is mounted in the cavity and is connected to the first and second spaced apart conductive traces 16/18, a lens 23, fig. 18, that extends across the cavity; and an encapsulant 5 between the semiconductor light emitting device 3 and the lens 23.

But, Chen (328) does not disclose a solid block is aluminum and an insulating layer 15 is aluminum oxide.

However, Chen (768) discloses a mounting substrate for a semiconductor light emitting device 103 in fig. 3J wherein the substrate 100 comprises copper,

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aluminum, or silicon, column 4 line 64. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the aluminum or silicon substrate teaching of Chen (768) to replace the silicon with aluminum in Chen (328)'s device, because such material replacement would have provided a comparable high electric and thermal conductivity and thus provides excellent heat dissipated capacity as taught by Chen (768), column 4 lines 43-46 and 62-65 and table 1.

With respect to aluminum oxide layer, at the time the invention was made; it would have been obvious to one of ordinary skill in the art to anodic oxidation aluminum substrate of Chen (768) in order to create a aluminum oxide dielectric layer, because such aluminum anodic oxidation is a typical process to make aluminum oxide dielectric layer on the aluminum substrate, see Kobayashi (6219223) in column 4 lines 30-35 fig. 2.

5. Claims 9, 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6531328 to Chen and US 6599768 to Chen as applied to the above claims 3 and 15 and further in view of US 2004/0222433 to Mazzochette et al.

Regarding claims 9 and 18, as discussed in the above claims 3 and 15, Chen (328) and Chen (768) disclose all the limitation of claims 9 and 18, except the through holes including the conformal insulating coating thereon.

But Mazzochette discloses a mounting substrate in fig. 4 comprises a metal base 11, a LED 10, a spaced apart conductive wires 13 [0025], a through hole 14 [0026], and a conformal dielectric layer 12 [0029]. At the time the

invention was made; it would have been obvious to one of ordinary skill in the art to use the teaching of through holes comprises conformal dielectric layer teaching of Mazzochette with Shie and Chen's device, because it would have enhanced the heat flow by the via that the LED package can operate at a high temperature as taught by Mazzochette, see abstract.

Regarding claim 19, Chen (328) discloses the LED wherein the face is a first face wherein the first and second through holes 14 that extend from the first face to a second face.

Regarding claim 20, Chen discloses the LED further in fig. 18 further comprising third and fourth space apart conductive traces 18/17 on the second face of the solid block a respective one of which is connected to a respective one of the conductive vias 14.

### ***Response to Arguments***

6. Applicant's arguments filed on 15 Mar. 2005 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X. Le whose telephone number is (571) 272-1708. The examiner can normally be reached on M-F from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on (571) 272 -1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Thao X. Le  
18 Apr. 2005



LONG PHAM  
PRIMARY EXAMINER